Subject: FormatDouble and numbers under 1e-15
Posted by koldo on Wed, 03 Mar 2010 09:33:04 GMT
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Hello all

There is a behavior I do not understand in function String FormatDouble(double d, int digits, int flags, int pad_exp) with numbers under 1e-15.

If you call FormatDouble(1e-16, 0) it returns "1e-16" instead of returning "0".

This is because of this line:
is_exp = ad && (ad <= 1e-15 || ad >= 1e15);

The question is, if I do not want decimals or a few of them, and number is very close to 0, the most intuitive output would be just 0, is not it ?

Subject: Re: FormatDouble and numbers under 1e-15
Posted by rylek on Thu, 04 Mar 2010 09:16:47 GMT
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Hello!

Well, it depends. I wrote three formatting functions for doubles, FormatDoubleFix, FormatDoubleExp and FormatDouble. They are very loosely modelled after C printf formatting options %f, %e, and %g, respectively. Now as %g (FormatDouble) is supposed to automatically select between %f and %e, I employed the exponent check to use %f as a form of "optimization" or "user preferable" output for small absolute values of exponent. However whenever the exponent gets either too high or too low, formatting the number in fixed notation results in an unreasonably long string of zeroes. Keeping in mind the double's are floating points, for a number in the range, say, 1e-20, there are about 16 valid decimal digits 20 positions right of the decimal point, and to display such number as 0 is a complete loss of precision in my opinion. After all, printf("%g", 1e-20) also prints 1e-020 and not 0.

Regards

Tomas

Subject: Re: FormatDouble and numbers under 1e-15
Posted by koldo on Thu, 04 Mar 2010 09:50:39 GMT
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rylek wrote on Thu, 04 March 2010 10:16Hello!

Well, it depends. I wrote three formatting functions for doubles, FormatDoubleFix, FormatDoubleExp and FormatDouble. They are very loosely modelled after C printf formatting options %f, %e, and %g, respectively. Now as %g (FormatDouble) is supposed to automatically select between %f and %e, I employed the exponent check to use %f as a form of "optimization" or "user preferable" output for small absolute values of exponent. However whenever the exponent gets either too high or too low, formatting the number in fixed notation results in an unreasonably long string of zeroes. Keeping in mind the double's are floating points, for a number in the range, say, 1e-20, there are about 16 valid decimal digits 20 positions right of the decimal point, and to display such number as 0 is a complete loss of precision in my opinion. After all, printf("%g", 1e-20) also prints 1e-020 and not 0.

Regards

Tomas

Hello Tomas

The comment comes from in FormatDouble() it is specified the number of digits, so if:

double num = 0.0000000000000001;
String str = FormatDouble(num, 0);

Now str = "1e-16".

As number of digits had to be 0, it seems the str would have to be just "0".

Subject: Re: FormatDouble and numbers under 1e-15
Posted by mirek on Fri, 05 Mar 2010 09:43:32 GMT
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What about using FormatDoubleFix instead?

Subject: Re: FormatDouble and numbers under 1e-15
Posted by koldo on Fri, 05 Mar 2010 10:33:44 GMT
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luzr wrote on Fri, 05 March 2010 10:43What about using FormatDoubleFix instead?
Yes, I will use it.
